

IN THE CLAIMS:

1. (Currently Amended): A process of recovering arabinose and optionally at least one other monosaccharide selected from the group consisting of galactose, rhamnose and mannose from vegetable fiber rich in heteropolymeric arabinose wherein the process comprises the following steps:

(a) controlled acidic or enzymatic hydrolysis of said vegetable fiber in an aqueous solution to hydrolyze more than 50% of the heteropolymeric arabinose present in the vegetable fiber into monomeric arabinose and to produce an aqueous hydrolyzate containing more than 10% arabinose on a dry substance content (DS) measured by Karl Fischer titration, at least one other monosaccharide selected from the group consisting of galactose [[,]] and optionally rhamnose and mannose, and optionally poly-, oligo- and/or disaccharides,

(b) optional neutralization of said aqueous hydrolyzate to obtain a neutralized hydrolyzate,

~~followed by at least one of the following steps (c) and (d):~~

(c) separation of solid hydrolysis residue from said aqueous hydrolyzate obtained in step (a) or from said hydrolyzate obtained in step (b),

[[(c)]] (d) optional fractionation of said aqueous hydrolyzate from step (c) in an aqueous solution to obtain a fraction enriched in arabinose, at least one other fraction selected from the group consisting of a fraction enriched

in rhamnose and a fraction enriched in mannose, and optionally one or more fractions enriched in poly-, oligo- and/or disaccharides, followed by the recovery of said fraction enriched in arabinose and optionally one or more of said other fractions, and

[[d)] (e) crystallization of arabinose in an aqueous solution from said hydrolyzate obtained in step (c) and from said fraction enriched in arabinose obtained in step (d), by boiling and cooling crystallization to obtain crystalline arabinose having an arabinose content over 98% on DS and galactose content of less than 2% on DS.

2. (Original): A process as claimed in claim 1, wherein said vegetable fiber rich in heteropolymeric arabinose contains more than 15% arabinose on DS.

3. (Original): A process as claimed in claim 2, wherein said vegetable fiber contains more than 35% arabinose on DS.

4. (Original): A process as claimed in claim 2, wherein said vegetable fiber rich in heteropolymeric arabinose is an exudate gum.

5. (Original): A process as claimed in claim 4, wherein said exudate gum is selected from gum arabic, gum ghatti and gum tragacanth.

6. (Original): A process as claimed in claim 1, wherein said vegetable fiber rich in heteropolymeric arabinose is sugar beet pulp.

7. (Currently Amended): A process as claimed in claim 1, wherein said vegetable fiber rich in heteropolymeric arabinose is selected from the group consisting of hardwood bark, grain straw and hulls, com husks, corn cobs, corn fibers and bagasse.

8. (Currently Amended): A process as claimed in claim 7, wherein said hardwood bark is selected from the group consisting of beech bark and birch bark.

9. (Original): A process as claimed in claim 1 wherein said vegetable fiber rich in heteropolymeric arabinose is water-soluble vegetable fiber.

10. (Cancelled).

11. (Currently Amended): A process as claimed in claim 1, ~~[[10,]]~~ wherein more than 70% of said heteropolymeric arabinose is hydrolyzed into monomeric arabinose.

12. (Original): A process as claimed in claim 11, wherein more than 80% of said vegetable fiber is hydrolyzed into monomeric arabinose.

13. (Cancelled).

14. (Currently Amended): A process as claimed in claim ~~13~~ 1, wherein the content of arabinose in said aqueous hydrolyzate is more than 15% on DS.

15. (Original): A process as claimed in claim 14, wherein the content of arabinose is more than 20% on DS.

16. (Original): A process as claimed in claim 1, wherein said hydrolysis is carried out as a selective hydrolysis by adjusting the hydrolysis conditions so as to obtain a hydrolyzate where the content of galactose is less than 10% on DS.

17. (Original): A process as claimed in claim 16, wherein the content of galactose is less than 5% on DS.

18. (Original): A process as claimed in claim 17, wherein the content of galactose is less than 2% on DS.

19. (Currently Amended): A process as claimed in claim 1, wherein said hydrolysis is carried out with an acid selected from the group consisting of mineral acids and organic acids.

20. (Original): A process as claimed in claim 19, wherein said morganic acid is sulphuric acid.

21. (Original): A process as claimed in claim 19, wherein said hydrolysis is carried out at a temperature in the range of 70 to 140° C, at a pH in the range of 0.7 to 2.5 and the hydrolysis is continued for 0.4 to 6 hours.

22. (Currently Amended): A process as claimed in claim 1, wherein said fractionation is carried out by chromatographic fractionation to obtain a fraction enriched in arabinose, at least one other fraction selected from the group consisting of fraction enriched in galactose, a fraction enriched in rhamnase and a fraction enriched in mannose, and optionally one or more fractions enriched in poly-, oligo- and/or disaccharides.

23. (Currently Amended): A process as claimed in claim 22, wherein said chromatographic fractionation is carried out using a column packing material ~~selected~~ which are from cation exchange resins.

24. (Currently Amended): A process as claimed in claim 23, wherein said cation exchange resins are ~~selected from~~ strongly acid cation exchange resins.

25. (Currently Amended): A process as claimed in claim 24, wherein the ion form of said strongly acid cation exchange resin is selected from the group consisting of H^+ , Na^+ , Ca^{2+} , Al^{3+} , Sr^{3+} and Ba^{2+} .

26. (Currently Amended): A process as claimed in claim 23, wherein said cation exchange resins are ~~selected from~~ weakly acid cation exchange resins.

27. (Currently Amended): A process as claimed in claim 26, wherein the ion form of said weakly acid cation exchange resins is selected from the group consisting of H^+ , Na^+ and Ca^{2+} .

28. (Original): A process as claimed in claim 22, wherein said chromatographic fractionation is carried out using a column packing material selected from anion exchange resins.

29. (Currently Amended): A process as claimed in claim 28, wherein said anion exchange resins are ~~selected from~~ weakly basic anion exchange resins.

30. (Currently Amended): A process as claimed in claim 28, wherein said anion exchange resins are ~~selected from~~ strongly basic anion exchange resins.

31. (Currently Amended): A process as claimed in claim 30, wherein the ion form of said strongly basic anion exchange resin is selected from the group consisting of HSO_3^- and SO_4^{2-} .

32. (Original): A process as claimed in claim 1, wherein said fractionation is carried out by membrane filtration.

33. (Original): A process as claimed in claim 32, wherein said membrane filtration is carried out by nanofiltration to obtain a fraction enriched in arabinose as the nanofiltration permeate and a fraction enriched in poly-, oligo- and/or disaccharides as the nanofiltration retentate.

34. (Currently Amended): A process as claimed in Claim 1, wherein the process comprises at least two fractionations selected from the group consisting of chromatographic ~~fractionation and/or~~ fractionation, membrane filtration and chromatographic fractionation and membrane filtration.

35. (Original): A process as claimed in claim 1, wherein said fraction enriched in poly-, oligo- and/or disaccharides is further subjected to hydrolysis to obtain a hydrolyzate containing galactose and optionally rhamnose, mannose and additional arabinose.

36. (Original): A process as claimed in claim 35, wherein the process further comprises separating galactose and optionally rhamnose, mannose and additional arabinose from said hydrolyzate.

37. (Original): A process as claimed in claim 1, wherein said crystallization of arabinose is carried out from said hydrolyzate.

38. (Original): A process as claimed in claim 1, wherein said crystallization of arabinose is carried out from said fraction enriched in arabinose.

39. (Cancelled).

40. (Currently Amended): A process as claimed in claim ~~[[39]]~~ 1, wherein said crystallization of arabinose is carried out from a solution having an arabinose purity of more than 65% on DS.

41. - 43. (Cancelled).

44. (Original): A process as claimed in claim 1, wherein said crystallization of arabinose is carried out in the presence of less than 10% galactose on DS as an impurity.

45. (Original): A process as claimed in claim 44, wherein said crystallization of arabinose is carried out in the presence of less than 5% galactose on DS as an impurity.

46. (Original): A process as claimed in claim 45, wherein said crystallization is carried out in the presence of less than 2% galactose as an impurity.

47. (Original): A process for the crystallization of arabinose from a biomass-derived solution, wherein said crystallization comprises boiling crystallization.

48. (Original): A process as claimed in claim 47, wherein said crystallization of arabinose is carried out from a solution having an arabinose purity of more than 65% on DS.

49. (Original): A process as claimed in claim 48, wherein said crystallization is carried out in the presence of less than 10% galactose on DS as an impurity.

50. (Currently Amended): A process as claimed in claim ~~49~~51, wherein said crystallization is carried out in the presence of less than 5% galactose on DS as an impurity.

51. (Currently Amended): A process as claimed in claim ~~50~~52, wherein said crystallization is carried out in the presence of less than 2% galactose on DS as an impurity.

52. (Currently Amended): A process as claimed in claim ~~49~~47, wherein said crystallization is carried out in water.

53. (Currently Amended): A process as claimed in claim ~~49~~47, wherein said crystallization further comprises washing of the arabinose crystals.

54. (Currently Amended): A process as claimed in claim ~~37~~47, wherein said crystallization provides a crystalline arabinose product having a purity of more than 60% on DS.

55. (Original): A process as claimed in claim 54, wherein the purity of the arabinose product is more than 70% on DS.

56. (Original): A process as claimed in claim 55, wherein the purity of the arabinose product is more than 90% on DS.

57. (Original): A process as claimed in claim 56, wherein the purity of the arabinose product is more than 98% on DS.

58. (Currently Amended): A process as claimed in claim ~~38~~ or 47, wherein said crystallization of arabinose provides crystalline arabinose having a purity of more than 98% on DS.

59. (Original): A process as claimed in claim 58, wherein the purity of crystalline arabinose is more than 99% on DS.

60. (Original): A process as claimed in claim 59, wherein the purity of crystalline arabinose is more than 99.5% on DS.

61. (Original): A process as claimed in claim 1, wherein the process comprises a further step of subjecting crystallized arabinose or said fraction enriched in arabinose to epimerization to convert arabinose to ribose.

62. (Original): A process as claimed in claim 1, wherein said arabinose is L-arabinose.

63.-74. (Cancelled).